US Army Medical Research and Materiel

Technology Available for Licensing

Anthrax Vaccines

Features and advantages:

- **Provides recombinant vaccines and methods for use, for *B. anthracis***
- **The protective antigen has demonstrated high levels of expression in eukaryotic cells**
- **Mice inoculated with virus replicon particles containing the PA-replicon produced [illegible] protected from anthrax when challenged**

Anthrax is a disease caused by the sporulating bacteria *Bacillus anthracis*. Untreated inhalation or gastrointestinal anthrax has a case fatality rate of essentially 100%, while cutaneous anthrax has a case fatality rate of up to 25%. Research has shown that the protective antigen (PA) produced by *B. anthracis* can protect mice from anthrax. The PA gene contains a prokaryotic secretory signal and the entire 83 kDa coding sequence.

This invention provides vaccines against anthrax, and specifically utilizes the PA produced by *B. anthracis*. The PA , or certain subdomains, are cloned into a Venezuelan equine encephalitis (VEE) virus vector. The result is a self-replicating RNA molecule, a replicon, that encodes its own replicase and transcriptase functions, while making abundant quantities of mRNA encoding the PA. When replicon RNA is transfected into eukaryotic cells (preferably along with helper RNAs that express VEE structural proteins), the replicon RNA is packaged into VEE virus-like particles by the VEE virus structural proteins. Since the helper RNAs lack packaging signals necessary for further propagation, the resulting virus particles (VRPs) are infectious for one cycle but [illegible]ctive thereafter. Upon infection of an individual [illegible] a VRP, an abortive infection occurs in which the infected cell produces the PA in abundance, and is ultimately killed by the infection but does not produce any viral progeny.

Patent Status

Patent No.: 6,770,479 Issued: August 3, 2004
Available from: www.uspto.gov Docket No.: RJID 98-21A

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KEYWORDS: vaccine; anthrax; *Bacillus anthracis*; protective antigens; Venezuelan equine encephalitis virus; replicon; VEE

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